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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/043,171	03/12/1998	STEPHEN MCLAUGHLIN	36-1136	6305

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EXAMINER

AZAD, ABUL K

ART UNIT PAPER NUMBER

2654

DATE MAILED: 05/05/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/043,171

Applicant(s)

MCLAUGHLIN ET AL.

Examiner

ABUL K. AZAD

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to the communication filed on November 6, 2003.
2. Claims 1-11 and 16-20 are pending in this action. Claims 12-15 have been canceled. Claims 19 and 20 have been newly added.
3. The applicant's arguments with respect to claims 1-11 and 16-18 have been fully considered but they are not deemed to be persuasive. For examiner's response to the applicant's arguments or comments, see the detailed discussion in the Response to the Arguments section.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 7-11 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Otsuka et al. (US 5,745,651).

As per claim 1, Otsuka teaches, "a method of generating a cyclic sound waveform corresponding to a sequence of substantially similar cycles," comprising the steps of:

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“(a) generating a cyclical sound waveform sample” (Abstract, col. 4, line 46 to col. 5, line 4);

“(b) generating a successive cyclical sound waveform sample from said cyclical sound waveform sample and transformation data, wherein said transformation data comprise data defining the evolution of the said cycles in the temporal vicinity of said cyclical sound waveform and the change in shape of said cycles in said temporal vicinity from cycle to cycle” (col. 2, lines 13-54, Fourier transform is performed on the resultant, transformed sample value to provide a pitch waveform, Fig. 15, element S317, where claimed limitation reads on “generate and connect pitch waveform for Ith frame);

“(c) designating said successive cyclical sound waveform sample as a cyclical sound waveform sample and repeating (b)” (col. 2, lines 13-54, reads “since a parameter that is acquired at specific sampling frequency is employed to generate pitch waveform for arbitrary sampling frequencies and to link them together, synthesized speech for an arbitrary sampling frequency can be generated by simple method”, Fig. 15, element S317 generated pitch wave form for each frame, so step b will be repeated);

“(d) repeating (c) a plurality of times to generate a sequence of said successive cyclical sound waveform samples corresponding to a plurality of said cycles” (col. 2, lines 13-54, Fig. 15, element S316);

“(e) outputting the samples of said sequence to generate a waveform” (col. 2, lines 59-64, a speech waveform can be generated by using a parameter in a frequency range).

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As per claim 2, Otsuka teaches, "said waveform comprises voiced speech" (Abstract).

As per claim 3, Otsuka teaches, "in which said transformation data does so by reference to a predetermined reference waveform sequence" (col. 2, lines 35-54, Fourier transform is performed on the resultant, transformed sample value to provide a pitch waveform)

As per claim 4, Otsuka teaches, "in which said reference waveform sequence comprises a stored speech waveform" (col. 4, lines 37-67).

As per claim 7, Otsuka teaches, "in which a given successive waveform sample is derived in accordance with data from a point on said reference waveform sequence at a position within a said cycle which corresponds to that of said given successive waveform sample, and at least one other point on said reference waveform sequence offset in time therefrom" (col. 7, line 19 to col. 8, line 65).

As per claim 8, Otsuka teaches, "in which said step (b) comprises calculating said transformation data from a set of stored waveform values" (col. 4, lines 37-67).

As per claim 9 and 11, Otsuka teaches, "in which the initial performance of said step (a) to initial synthesis of said waveform comprises a step of selection of an initial value which differs from a previous initial value selected on a previous synthesis of said waveform." (col. 8, lines 26-45).

As per claim 10, Otsuka teaches, "in which said step comprises applying a pseudo random number generation algorithm to select said value" (col. 7, lines 45-54).

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As per claim 18, it is interpreted and thus rejected for the same reasons set forth in the rejection of claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5, 6, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 5,745,651) in view of Kleijn et al. (Speech Coding and Synthesis).

As per claim 16, Otsuka teaches, "a method of generating a synthetic voiced waveform," said method comprising:

"storing data defining n-dimensional state space representations of voiced speech signals, in which successive voiced speech pitch pulse cycles are superimposed to provide a model of voiced speech dynamics" (col. 4, line 24 to col. 5, line 4);

"selecting a synthesized waveform starting point in said n-dimensional state space representation for a predetermined voiced speech waveform that is offset from said stored data by an offset vector" (col. 7, line 35 to col. 8, line 58);

"selecting successive further synthesized waveform points in said n-dimensional state space representation for said predetermined voiced speech waveform that are

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also respectively offset from said stored data in dependence jointly upon the preceding point in the synthesized sequence nearest other stored points in state sequence space and an offset vector therefrom" (col. 7, line 35 to col. 8, line 58);

"repeating (b) and (c) for plural voiced speech cycles and outputting the resulting sequence of thus synthesized waveform points to generate a voiced speech waveform" (col. 7, line 35 to col. 8, line 58).

Otsuka does not teach that n being an integer having a value at least three. However, Kleijn teaches the above limitation (Pages 584-586). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Otsuka with $N=3$ as taught by Kleijn because Kleijn teaches that an $N=3$ deterministic system can reproduce a naturally sounding voiced speech waveform.

As per claim 17, it is interpreted and thus rejected for the same reasons set forth in the rejection of claim 16.

As per claim 5, Otsuka does not explicitly teach, "in which said steps (a) and (b) comprise generating a plurality of values representing said waveform sample values as a point in a multidimensional space in which corresponding portions of successive said cycles are substantially superposed". However, Kleijn teaches the above limitation (Pages 584-586). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Otsuka with $N=3$ as taught by Kleijn because Kleijn teaches that an $N=3$ deterministic system can reproduce a naturally sounding voiced speech waveform.

As per claim 6, Otsuka teaches, "in which said data defining said transformation does so by reference to a predetermined reference waveform sequence and in which said transformation data represents a transformation . . . successive to the first, on said reference waveform sequence to a corresponding second point on the waveform to be synthesized" (col. 7, line 19 to col. 8, line 65).

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsumi (US 4,635,520) in view of Otsuka et al. (US 5,745,651).

As per claim 19, Mitsumi teaches, "a method of generating a cyclical sound waveform corresponding to a sequence of substantially similar cycles", and method comprising:

"generating a first instantaneous value of the amplitude of a cyclical sound waveform" (col. 3, lines 30-63);

"generating a second instantaneous value of the amplitude of a cyclical sound waveform from said first instantaneous value" (col. 3, lines 30-63);

"designating said second instantaneous value as a first instantaneous value and repeating (b)" (col. 3, lines 37-44);

"repeating (c) a plurality of times to generate a sequence of said instantaneous values corresponding to a plurality of said cycles" (col. 3, lines 37-44);

"outputting the instantaneous values of said sequence to generate a waveform representing a cyclical sound" (col. 3, lines 55-63).

Mitsumi does teach a temporal vicinity of waveform data (Fig. 3), but does not explicitly teach a transformation data. However, Otsuka teaches transformation data

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(col. 2, lines 46-54, Fourier transformation is performed on the resultant, transformed sample value to provide a pitch waveform). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a transformation to provide a pitch waveform in the invention of Mitsumi because Otsuka teaches that the timber of synthesized speech can be changed without performing a complicated process, such a parameter operation (col. 2, lines 50-54).

Claim 20 is interpreted, thus rejected for the same reasons set forth in the rejection of claim 19.

Response to Arguments

9. The applicant argues: "the cited reference does not "generate a cyclical sound waveform sample" of "a successive cyclical sound waveform sample" as that terminology is defined and used in the present application, including in the present claims".

The examiner disagrees with the applicant's assertion, because Otsuka teaches the generation of cyclical sound waveform sample at Fig. 15, element S316, or col. 19, line 4 to col. 20, line 32. Otsuka teaches at Fig. 15, element S317, where claimed limitation reads on "generate and connect pitch waveform for Ith frame, where pitch waveform is substantially similar cycles.

The applicant has misinterpreted the word "sample". The word "sample" defined in "The authoritative Dictionary of IEEE Standards and Terms" seventh edition, 2000. Page 1000 as "one or more units of product drawn from a lot, the units of sample being

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selected at random with out regard to their quality” also define sample data as “data in which the information content can be, or is, ascertained only at discrete intervals of time.

10. The applicant further argues: “nowhere in this passage does Otsuka even mention n-dimensional state space representations of voiced speech signals refered to in the claims and also described on pages 4-6 of the present application”.

The examiner disagrees with the applicant's assertion, because Otsuka teaches n-dimensional state space representations of voiced speech signals (see Fig. 11, here a 2-dimentional state space representations of voiced speech is shown).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-3838**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richemond Dorvil**, can be reached at **(703) 305-9645**.

Any response to this action should be mailed to:

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Or faxed to:

(703) 872-9314

(For informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center's Customer Service Office at telephone number **(703) 306-0377**.

Abul K. Azad

April 26, 2004


RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER